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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,824	03/22/2004	Tieyu Zheng	111079-135672	1482

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EXAMINER
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GOLUB, MARCIA A

ART UNIT	PAPER NUMBER
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2828

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/805,824	<b>Applicant(s)</b> ZHENG, TIEYU	
	<b>Examiner</b> Marcia A. Golub	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/19/07</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

**Claims 28 and <sup>4</sup>23** are objected to because of the following informalities: they depend on claims 25, but should be dependent on claims 27 and 26 respectively. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 25-30, 32-36, 42-46** are rejected under 35 U.S.C. 102(b) as being anticipated by Stewart et al. (2003/0043868), hereinafter '868.

Figs 1 and 3 of '868 discloses an optoelectronic module comprising:

25. "a substrate [102] defining a stepped upper surface having a lower portion and an upper portion, the substrate being configured such that a lower surface thereof determines a footprint of the module;

a thermo-electric cooler [200] disposed on the substrate [102];

a laser light source [106] disposed on the thermo-electric cooler [200] such that the thermo-electric cooler is disposed between the substrate [102] and the laser light source [106], wherein the thermo-electric cooler is further thermally coupled to the laser light source to cool the laser light source; and

an electrical connection [110] extending from the upper portion of the upper surface of the substrate [102] to the laser light source [106].

26. "further comprising a structure [300] defining an enclosed environment and including the substrate, wherein:

the substrate [102] is at least partially disposed in the enclosed environment; and

the thermo electric cooler [200], the laser light source [106] and the electrical connection [110] are disposed in the enclosed environment.

27. "further comprising a laser light control device [104] disposed on the upper portion of the stepped surface of the substrate [102] and in the enclosed environment [300], the electrical connection [110] electrically coupling the laser light control device [104] to the laser light source [106].
28. "wherein the laser light control device [104] includes a driver [current].
29. "wherein the thermo-electric cooler [200] includes a plurality of elongated thermo-electric elements [114] disposed substantially in parallel between a top [112] and a bottom [118] portion of the thermo-electric cooler, the top portion [112] of the thermo-electric cooler [200] having a top planar surface that is substantially orthogonal to the thermo-electric elements [114].
30. "wherein the laser light source [106] is disposed on the top planar surface of the top portion [112] of the thermo-electric cooler [200].
32. "wherein the substrate [102] includes a plurality of vias [holes for 104] electrically connected [110] to the thermo-electric cooler [200] and adapted to dissipate thermoelectricity from the thermo-electric cooler.
33. "wherein the thermo-electric cooler [200] and the upper portion of the stepped surface [102] are disposed such that the upper portion is substantially co-planar with a top surface [112] of the thermo-electric cooler. (Fig 2)
34. "wherein the substrate [102] includes a substrate body comprising a one-piece component.
35. "wherein the thermo-electric cooler [200] is disposed on the lower portion of the stepped surface [102].
36. "wherein the substrate [102] includes a plurality of vias [holes for 104] electrically connected to the laser light control device [104].
42. "wherein the laser light source [106] comprises a laser diode device.
43. "further including a cap [300] partially defining the enclosed environment, the cap being disposed on the substrate [112].
44. "further comprising an overhanged ring disposed on a perimeter of the substrate [102] and supporting the cap [300] thereon.
45. "wherein the cap [300] includes an optical window [304] adapted to facilitate an

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exit of laser light bundles from the enclosed space.

46. "wherein the optical window includes a flat glass window."

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over '868 as applied to claim 25 above, and further in view of Watts et al. (6,729,143), hereinafter '143.

'868 discloses an optoelectronic module as described above, in addition '868 discloses using a submount between the laser and the TEC. However, Fig 3 of '143 discloses:

31. "wherein the laser light source [12] is disposed directly on the thermo-electric cooler [31]."

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '143 into the device of '868 by placing the laser directly on top of the TEC for at least the purpose of improving the heat dissipation from the laser.

**Claims 37-39** are rejected under 35 U.S.C. 103(a) as being unpatentable over '868 as applied to claim 25 above, and further in view of Acklin et al. (6,778,576) hereinafter '576.

'868 discloses an optoelectronic module as described above, but does not disclose:

37. "wherein the laser light source emits light bundles in a direction substantially parallel with a top surface of the thermo-electric cooler, the module further including an optical device disposed on the substrate and adapted to redirect the light bundles from the direction substantially parallel with the top surface of the thermo-electric cooler to a

direction that is substantially orthogonal to the top surface of the thermo-electric cooler.

38. wherein the optical device includes at least one of a mirror assembly and prisms.

39. wherein the optical device is disposed on the thermo-electric cooler.”

However, Fig 1 of '576 discloses using a mirror and lens assembly disposed on top of a TEC to redirect the light emitted by the laser in a perpendicular direction.

The device disclosed by '868 does not need a light steering assembly since the light emitted by the laser is directed in a vertical direction already. If, however, the laser was positioned to emit light parallel to the substrate then the mirror and lens system disclosed by '572 could have been used to redirect the output light. Therefore, the light steering assembly is not required since the light is emitted in the desired direction.

Elimination of an element if its function is not needed is discussed in MPEP 2144.04.

**Claim 40** is rejected under 35 U.S.C. 103(a) as being unpatentable over '868 as applied to claim 25 above, and further in view of Rosenberg et al. (6,703,561) hereinafter '561.

'868 discloses an optoelectronic module as described above, but does not disclose:

40. “wherein the substrate includes a ceramic material.”

However, '561 discloses making the substrate 70 out of a ceramic material. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '561 into the device of '868 by making a ceramic substrate for at least the purpose of improving the heat dissipation from the laser.

**Claim 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over '868 as applied to claim 25 above.

'868 discloses an optoelectronic module as described above, in addition '868 discloses making the top plate of the TEC to be T-shaped, but does not disclose:

41. “wherein the thermo-electric cooler comprises a T-shaped bottom portion.”

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of '868 by making the bottom portion of the TEC T-shaped for at least the purpose of accommodating the TEC inside the optical module.

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**Contact Info**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcia A. Golub whose telephone number is 571-272-8602. The examiner can normally be reached on M-F 9-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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